

Standards for PE-X pipes – more than just Hot & Cold plumbing applications

The properties of PE-X materials have allowed the development of standards specifying PEX pipes systems for a whole range of applications, not only Hot & Cold plumbing applications.

Product standards for plastics pipes systems are developed principally by ISO/TC 138 and CEN/TC 155, but also CEN/TC 107 has developed standards for flexible district heating pipes using plastics carrier pipes. These technical committees have been busy over the last decade resulting in a whole range of standards specifying PE-X materials.

Many readers will be familiar with the PE-X Hot & Cold plumbing EN ISO 15875 standard, and the EN ISO 21003 Multilayer pipe standard including PE-X as one of the principle reference materials. Outdoor multilayer pipes for water supply are covered by ISO 21004. For underfloor heating additional specifications can be found in EN 1264.

EN ISO 15875-1/2/3/5 Plastics piping systems for hot and cold water installations – Cross-linked polyethylene (PE-X)

EN ISO 21003-1/2/3/5 Multilayer piping systems for hot and cold installations inside buildings

EN 1264-1/2/3/4 Floor heating - Systems and components

ISO 21004 Plastics piping systems — Multilayer pipes and their joints, based on thermoplastics, for water supply

In addition national standards are available for Hot and Cold plumbing systems, for example DIN, BS, and ASTM.

PE pipe systems are solving the corrosion issues of metals used for gas distribution but restricted normally to an operating temperature range of around 0 °C to 40 °C. This excellent experience resulted in a demand from the gas industry for plastics that can be used above and below this temperature range, and also for use in more severe installation conditions. The properties of PE-X are satisfying this demand by allowing the material to be specified for gas distribution pipeline systems in severe climates which exclude the use of other plastics. PE-X is resistant to both extremes of temperature allowing use for gas application from -50 °C to +60 °C. However it is not just temperature resistance but the impressive fracture resistance which has allowed the material to be specified. Resistance to RCP rapid crack propagation at low temperatures and high resistance to slow crack growth are essential properties of a material to be used for gas pipes.

ISO 14531-1/2/3/4 Plastics pipes and fitting – Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels – Metric series – Specifications

Whilst multilayer pipe systems are usually associated with plumbing and underfloor heating applications similar standards are also in place for gas applications, ie

ISO 17484-1/2 Plastics piping systems. Multi-layered pipe systems for indoor gas installations with a maximum operating pressure up to and including 5 bar

ISO 18225 Multilayer piping systems for outdoor gas installations – Specifications for systems

Last but not least, RTP Reinforced Thermoplastics Pipes have been developed for high pressure gas and oil applications. Typically these constructions comprise of either a PE or PE-X base pipe with a Kevlar tape reinforcement covered by an outer PE layer.

ISO TS 18226 Reinforced thermoplastics pipes for high pressure gas applications
Status – published 2006

PE-X materials have been used for the carrier pipe for flexible district heating pipes for many years in accordance with national and industry standards. EN 15632 has been finally completed by CEN/TC 107 and publication is imminent. PE-X is one of two plastics materials specified for the carrier pipe.

EN 15632-1/2/3/4 District heating pipes — Pre-insulated flexible pipe systems

PE-X has been used extensively for industrial applications although specific standards are somewhat lacking in this area. In recognition of this ISO/TC 138/SC3 is about to embark on a revision of the EN ISO 15494 Polyolefins for industrial applications standard with the aim of adding the material and generally updating the standard.

PE-X is one of the most versatile materials used for plastics pipeline applications, exceptional toughness and temperature resistance allow it to be specified for a whole range of water and gas distribution applications and other industrial applications.

For more information on PE-X materials see www.pex-association.com or contact the PEX Association on the link from this site.